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1885

A.D. 1885. March 24. N° 3810.

STOCKER'S Complete Specification.

(1 SHEET)

FIG. 2.

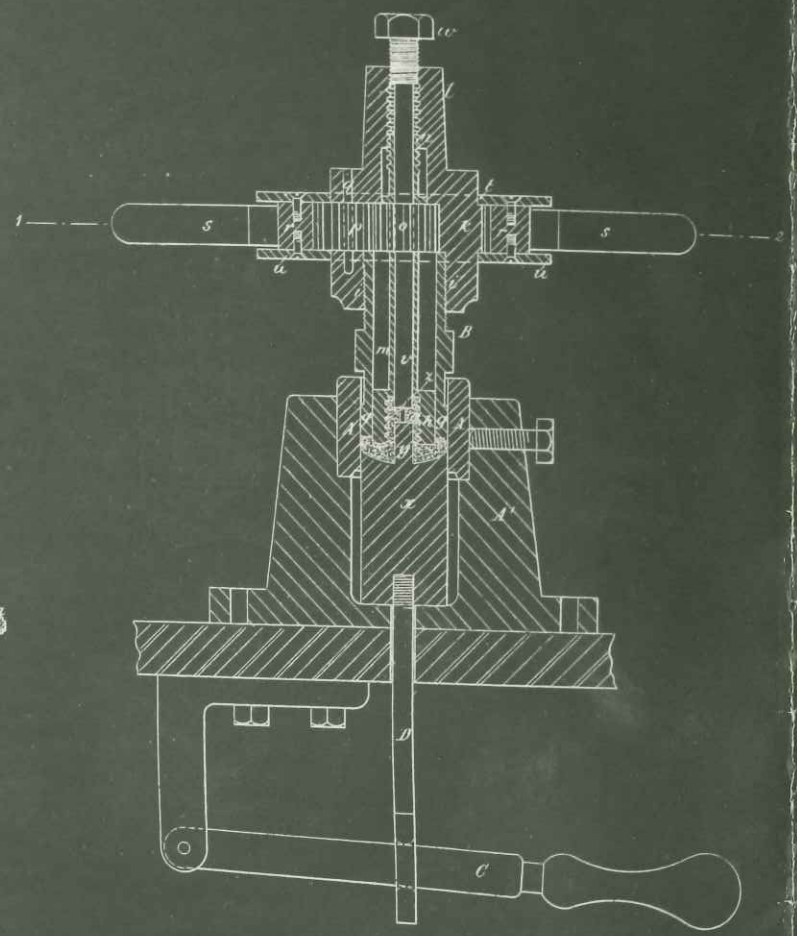


FIG. 1.

FIG. 3.

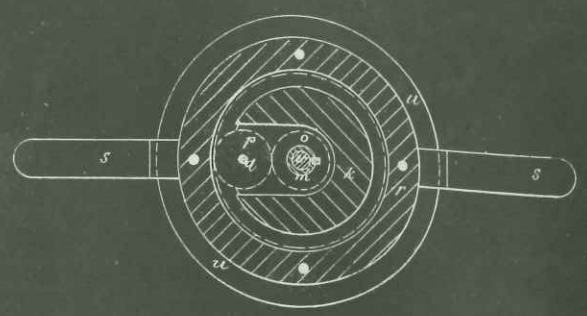


FIG. 4.

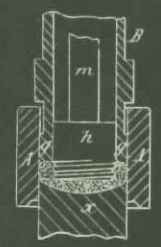


FIG. 7.

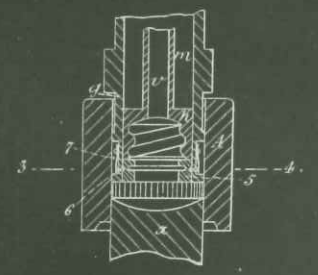


FIG. 8.

FIG. 5.

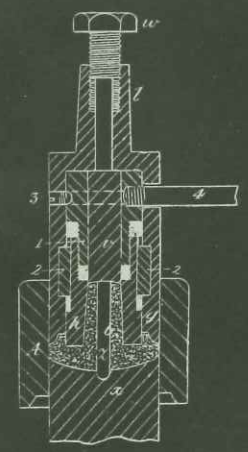
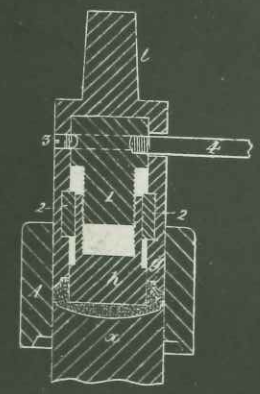


FIG. 6.



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Malby & Sons, Photo-Litho.

COMPLETE SPECIFICATION.

Improvements in Stoppers for Bottles and similar Articles, and in Apparatus Employed in their Manufacture.

I ALEXANDER RICHMOND STOCKER of 76 Glengall Road, Peckham in the County of Surrey, Manufacturer, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention has for its object improvements in the top tool or plunger employed in conjunction with a matrix and lifter for the production by pressure from clay dust or other compressible material, of stoppers and caps of various kinds whether screwed or plain and whether perforated or solid; also a new or improved manufacture of the class of feeding bottle stopper provided with a loose ball valve.

Figure 1 of the accompanying drawings is a vertical section of a valve-feeding-bottle-stopper constructed according to my invention.

I make the enlarged head *a* and stem *b* whether screwed or plain, in one piece from clay dust compressed between suitable dies and matrices of the required contour and at the same time I perforate the stopper and form in the body thereof a cavity *c* for the reception of the loose ball valve. The perforated nipple *d* for the attachment of the flexible feeding tube is made separately by compression from clay dust by the aid of suitably shaped dies as is well understood and is then fixed by screwing or otherwise into the mouth of the cavity *c* after the loose ball valve has been introduced therein as shown in the drawing. I also prefer to make separately from clay dust by compression, the short perforated tube *e* which serves to receive the junction rubber ring of the usual glass tube inside the feeding bottle a recess being provided in the end of the stem *b* for the reception of the short tube *d*, the whole being then finished by glazing and firing. The stem *b* may be either screwed or left plain or provided with the usual longitudinal ribs or projections on its surface for more tightly holding the cork covering or packing. *f* is the usual annular recess formed in the underside of the head *a* for the reception of a packing ring if required.

Figure 2 of my drawings is a vertical section of one arrangement of my improved top tool or plunger working in conjunction with a matrix, and arranged for the production from compressed clay dust of screwed stoppers and caps generally the drawing showing it as specially adapted for making the main portion of the valve-feeding-bottle-stopper hereinbefore described.

Figure 3 is a horizontal section taken along the line 1—2 in Figure 2.

Figure 4 is a vertical section of the lower portion of the improved top tool or plunger with its matrix as arranged for the production of a screwed pomade cap.

Figure 5 is a vertical section of a simplified arrangement of the improved top tool or plunger with its matrix as adapted for making an ordinary feeding bottle stopper with a plain or unscrewed stem or shank for the cork packing.

Figure 6 is a similar view of the same tool or plunger with its matrix as adapted for making plain or unscrewed pomade caps.

Figure 7 is a vertical section and

Figure 8 a horizontal section, (taken along the line 3—4) of my improved top tool or plunger as adapted for making from compressed clay dust a screwed plug stopper of the kind described in my specification N° 15056 filed concurrently herewith.

A is the matrix or lower die which may be of the ordinary construction and provided with the usual lifter for facilitating the removal of the moulded or compressed article as is well understood. B is my improved top tool or plunger working in connection with the corresponding matrix A. This plunger consists essentially of the combination, together of a hollow shell *g* rigidly connected with an ordinary or other suitable press (not shown in my drawings) and a central moveable die *h* which, when screwed articles are to be produced receives a rotary as well as an up and down motion inside the hollow shell but when plain work only is required this moveable die is caused to slide vertically within the shell *g* without rotary motion. In Figure 2 the outer shell *g* is shown as screwed at *i* directly into the block or holder *k* which is firmly secured to the press by a shank *l* or otherwise. The hollow shell *g* in all cases fits accurately inside the matrix A fixed in the usual manner into a block A^1 secured to the bed of the press mounted on the work bench. The central die *h* fits accurately the interior of the hollow shell *g* and when a screw thread is to be produced on the article as in the examples shown in Figures 1, 2, and 4 the central die is fitted or formed with a spindle *m* having a screw thread *n* formed upon it of a pitch corresponding to that of the thread to be produced on the article. The screwed part *n* works in an internal screw formed in any convenient part of the block or holder *k* or of the hollow shell *g*—Rotary motion when required is imparted in any convenient manner to the die *h*. In Figures 2 and 3 this is effected by a toothed pinion *o* inside a chamber in the block *k* through which pinion the spindle *m* slides freely upwards and downwards it being made flat sided at that part or connected with the pinion by a slot and feather (see Figure 3). This pinion gears into a carrier pinion *p* turning on a vertical pin *q* in the block and gearing into an internal toothed ring *r* provided with handles *s s* for rotating the same. The said ring whilst being free to rotate, is maintained in position on the block *k* by the inner projecting flange *t* resting on a shoulder on the outside of the block *k* and by the lower ring or flange *u* screwed to the toothed ring *r* and bearing against the underside of the said shoulder. On rotating the internal toothed ring *r* the central die *h* and its spindle *m* will be rotated and will at the same time be moved upwards or downwards as the case may be by the screw thread at *n*. When the article to be produced is formed with a projecting stem or nipple *b* as shown in Figures 1, 2 and 5 it is important in order to avoid fracture or injury of the stem or nipple whilst the central die *h* is being unscrewed or raised therefrom for the purpose of releasing that part of the article, that the said stem be held down from above and this I accomplish by an adjustable central rod *v* passing longitudinally through the spindle *m* (made hollow for the purpose) and into the die *h* said spindle being fixed at its upper end to the block *k* by an adjusting screw *w* whilst its lower end bears upon the top of the stem *b* of the article. The screw *w* serves to regulate the height of the lower end of the holding down rod *v* to suit the height of the stem on the article to be produced. In Figure 2 this rod *v* is shown as projecting slightly below the top of the screwed chamber or cavity in the die *h* which forms the screwed stem *b* of the article in order to produce a slight recess in the end of the stem for the introduction of the short perforated junction tube *e* of the feeding bottle stopper hereinbefore described in reference to Figure 1. If the article is required to be wholly or partially perforated this may be accomplished by a perforating pin of suitable length fixed to the moveable die *h* or to the bottom of the rod *v* of the plunger or fixed to the upper surface of the lifter die *x* in the matrix it being immaterial whether the article is perforated from above or from below. In figure 2 *y* is a projection in

the centre of the lifter die *x* for forming the cavity *c* (see figure 1) for the reception of the loose ball valve. *z* is the perforator for perforating the otherwise closed end of the said cavity, it is here shown as forming a part of the lower or lifter die *x* the end of the perforator entering a small recess in the bottom of the rod *v* as shown. C is a handle engaging with a spindle D secured to the lifter die for elevating the same.

In Figure 4 the perforator is not required and the lower end of the central moveable die *h* is screwed to form the screw thread in the interior of a pomade cap the said die being rotated and caused at the same time to rise and fall inside the shell *g* as described with reference to Figure 2.

In Figure 5 the perforator or spindle *z* which produces the central opening or passage in the stopper for the reception of the rubber tube of a feeding bottle top for example is attached to or formed in one with the holding-down rod *v* of the top tool or plunger and is of sufficient length to penetrate the entire depth of the article and to enter a short distance into a recess formed in the centre of the lifter die *x*.

In the simplified arrangements shown in Figures 5 and 6 the central moveable die *h* is required to be lifted only without rotating in order to release the article and this I accomplish by the action of a screw 1, turning freely inside the shell *g* and engaging with a corresponding screw thread in or on the central moveable die *h* which latter is prevented from turning along with the screw 1, by a pin or feather in the shell engaging into a slot or groove 2, made longitudinally in the side of the die *h*. The head of the actuating screw 1, is maintained in position vertically inside the shell *g* by an annular groove formed therein into which a pin 3, in the outer shell engages. A sufficient amount of rotary motion is imparted to the screw 1, to withdraw the die *h* to the required extent by a handle 4 attached to the head of the screw 1, and working in a slot or opening in the outer shell so that by imparting the requisite circular movement to the said handle in either direction the die *h* will be raised or lowered accordingly inside the shell *g* the amount of movement to be imparted to the handle depending on the pitch of the screw 1.

Before compressing the clay dust in the matrix A the central moveable die *h* of the plunger should be properly adjusted in the shell *g* so as to protrude therefrom the required distance according to the depth of recess to be made in the article. The matrix is then charged with sufficient clay dust to form the particular article required and the plunger is next brought down into the matrix A so as to impart the requisite pressure to the clay dust. The central die *h* of the plunger is then raised slightly as hereinbefore described so as to release it from the article whilst it is held down at its outer edges by the shell *g* after which the entire plunger and outer shell is lifted leaving the article in the matrix. To free the article from the matrix the lifter die *x* is elevated until the article is brought on a level or thereabouts with the upper edge of the matrix whence it is removed by the attendant and a fresh charge of clay dust is introduced and so on. As it would not be practicable (when making by compression from clay dust the peculiar plug stopper described in my specification N° 15056 A.D. 1885 filed concurrently herewith) to release from the central moveable die *h* that part of the screwed plug which includes the annular groove for the packing ring, the rounded annular projecting ridge and the reduced portion of the stem referred to in the said specification, I propose to accomplish this by an arrangement similar to that shown in vertical and horizontal section of the plunger at Figures 7 and 8 respectively where 5 indicates a supplementary removeable die divided diametrically into two separate halves said divided die being so adjusted within the shell *g* as to shape the particular portion of the stopper above referred to and to be then readily released or detached from the shell, whilst still clinging to the stopper, by the rising of the top tool—The two halves of the divided supplementary die 5 are separated laterally and detached from the stopper, after it has been lifted from the matrix, by the hand of the attendant. The said die 5 is then replaced again in the shell *g*

so as to bear against the lower face of the central die *h* in readiness for the next descent of the plunger. To facilitate the separation of the two halves of the supplementary divided die 5 their junction edges may be bevelled as shown in figure 8 for the insertion of the point or edge of any convenient separating tool. In order to maintain the divided die in its place when the top tool is elevated two small pins or catches 6 pressed inwards by metal springs 7 or if preferred by a rubber band stretched over their outer ends are caused to enter an annular V shaped groove formed round the exterior of the two halves of the divided die the said pins or catches having only just sufficient hold to prevent the supplementary die 5 from dropping out of the tool when elevated whilst permitting the shell *g* to be withdrawn from the die 5 when the top tool is raised the two halves of the die 5 being left behind adhering to or embracing the plug of the stopper.

It is obvious that my improved compound plunger although described and illustrated as working from above in conjunction with a matrix below may be worked in an inverted position that is to say from below upwards through the bottom of the matrix an ordinary plunger or top tool being in that case employed for shaping the upper surface of the article, the outer shell *g* serving as the lifter die.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is

1. The manufacture of valve-feeding-bottle-stoppers by fashioning or forming the chamber or cavity for the loose valve, the enlarged head and the plug of the stopper from clay dust by compression between suitably shaped dies and matrices substantially as specified.

2. As a new article of manufacture I claim the valve-feeding-bottle-stopper illustrated by Figure 1 of the drawings annexed when manufactured in the manner and from the material hereinbefore specified.

3. In a compressing die or tool for shaping plain or screwed stoppers and caps and such like articles from clay dust the combination of a hollow outer shell fixed to a press, and a central moveable die receiving a vertical sliding motion or a combined rotary and vertical motion inside the said hollow shell independently of the movement of the press substantially as and for the purpose specified.

4. The use in combination with the aforesaid improved compressing die or tool of a matrix fitting accurately the exterior of the said hollow shell and provided with a lifter die substantially as and for the purpose specified.

5. The combination with the aforesaid improved compressing die or tool of a central adjustable rod bearing upon the centre portion of the article so as to hold it down whilst the independently actuated central moveable die is being released therefrom substantially as and for the purpose specified.

Dated this 24th day of December 1885.

EDWIN P. ALEXANDER, Fel. Inst. P.A.,
Agent.

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1886.